

A NEW SUBSPECIES OF LYCÆNA EPIXANTHE
BOISDUVAL & LECONTE WITH COMMENTS
ON THE IDENTITY OF TYPICAL EPIX-
ANTHE (LEPIDOPTERA,
LYCÆNIDÆ)

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Type material of *Lycæna epixanthe* (Boisduval and LeConte) (1) exists in the form of two female specimens (cotypes) which were formerly in the Oberthür collection, later acquired by Dr. Wm. Barnes, and now in the United States National Museum in Washington, D. C. (For more detailed information about these specimens, see Barnes and Benjamin (2), Doubleday (3), and Kirby (4).) Both cotypes are labeled under the Boisduval manuscript name as "*Chrysoph. hypoxanthe (epixanthe) Type*," but no data as to the date of capture or the locality are attached. In their original description, the authors mention New Harmony, Indiana as the type locality of *epixanthe*. However, some error must have occurred because a number of circumstances strongly suggest that the cotypes were *not* taken at New Harmony in the extreme southwestern portion of Indiana, but probably somewhere along the eastern seaboard—quite likely in the State of New Jersey. I have carefully examined large series of *epixanthe* from most of the territory where the species is known to range and it would appear that aside from the northern subspecies *L. e. amicitus* (Scudder) (*phædrus* Hall), intermediate forms, and a new mideastern subspecies about to be described, the eastern race (represented by the form occupying the southeastern extent of the range, namely, southern New England, lower New York and New Jersey) is recognizably distinct, chiefly by having a shade of straw yellow as the ground color of the under surface of the wings. It is advisable to mention here that a number of authors have described *epixanthe* as having the ground color of the under surface of the wings "various shades of grey," apparently overlooking the fact that Boisduval and LeConte's original

description calls for "whitish-yellow" ("Le dessous des ailes est d'un jaune blanchâtre") (5). Furthermore, the under surface of the figure of *epixanthe* illustrated in Boisduval and LeConte's original description (fig. 5, pl. 38) is definitely yellowish and not grey or white. It is therefore difficult to understand what various writers had in mind when describing *epixanthe* as greyish below. Could it be that they based their description on faded specimens, the occasional lighter colored (albinic) aberrational form of the eastern race or the midwestern subspecies? This should be taken into consideration; otherwise, it may lead to a great deal of confusion in regard to the type of *epixanthe* or to the taxonomy of the species. It should be mentioned that in isolated cold bogs in some sections of the eastern states, minor local races differ slightly from what may be considered as the normal eastern subspecies. Specimens from the Passadumkeag Bog in Maine presented to me a number of years ago by Mr. L. Paul Grey of Lincoln, Maine, appear to be intermediate between *L. e. amictus* (Scudder) and the new midwestern subspecies; that is, the under surface of the secondaries is grey and the dark brown maculations are very much reduced in size. Furthermore, these particular specimens are smaller than typical *epixanthe*. The occurrence of minor, local or ecological races is what might be expected of a butterfly with decidedly local habits after becoming isolated from the main stem or population, during the course of perhaps thousands of years. Minor or local races may be insignificant taxonomically, although they may be of decided interest to the students of Ecology, Genetics or Evolution. A great deal more study is necessary before the status of the races of *epixanthe* is clearly understood, but for the present, I believe that the species is represented by at least three recognizably distinct subspecies; namely, *amictus* (Scudder) in the extreme north (Newfoundland and Nova Scotia), *epixanthe* (B. & L.) (subject to further study and possible division) in the eastern states as far south as southeastern New Jersey, and a midwestern subspecies, described below, occurring in Wisconsin, Michigan, possibly northern Indiana and perhaps other adjacent states.

The evidence which indicates that the authors of *epixanthe* were probably in error as to the type locality, New Harmony,

Indiana, is as follows: If Boisduval and LeConte's type was taken in New Harmony, it is logical to assume that it should correspond with the midwestern race. But in comparing the cotypes in the United States National Museum with specimens of typical eastern and midwestern material, it can be clearly seen that these cotypes are close to or identical with the eastern subspecies. For instance, one of the cotypes has the under surface of the wings "straw color" while the other is somewhat lighter in shade but yellow enough to be recognized as belonging to the eastern subspecies. They resemble particularly specimens from the southern portion of the range, namely, southern New York and New Jersey.

After corresponding with Indiana lepidopterists, I cannot find any evidence that *epixanthe* has ever been taken in the vicinity of New Harmony, or in fact, in the State of Indiana except in Lake County which is approximately 250 miles north of New Harmony. Blatchley (6) in 1892, recorded *epixanthe* as occurring in Indiana (Lake County) in July and August and the most recent list of Indiana butterflies by Montgomery (7) repeats Blatchley's record without adding any new ones. Blatchley's specimens do not appear to be available for study which is unfortunate since they would undoubtedly correspond with the midwestern subspecies judging by the geographical position of Lake County, Indiana.

A report kindly sent by Professor B. Elwood Montgomery of Purdue University (July 3, 1947), states that he could find no evidence of either *Lycæna epixanthe* or its food plant (cranberry) while on a collecting trip of several days in South-central Indiana from Jefferson to Orange Counties.

Information which I have been able to obtain from botanists also suggest that Boisduval and LeConte's cotypes were not taken in the neighborhood of New Harmony, Indiana, because there are no records of the food plant of the species; namely, cranberry (*Vaccinium macrocarpon* Ait. or *V. oxycoccus* L.) occurring in Indiana nearer to New Harmony than Delaware County. Dr. Charles E. Olmstead, Associate Professor, Department of Botany, University of Chicago, advises me that so far as he knows *V. oxycoccus* is entirely northern in its distribution, occurring only in the northern counties of Indiana, Ohio and further northward.

In "Shrubs in Indiana," Dean lists cranberry as being confined to northern Indiana. It is, of course, possible that plants other than cranberry may be used by *epixanthe* larvæ as a food plant. However, this is not very likely because no lepidopterist to my knowledge has reported finding the larvæ of *epixanthe* feeding on other than cranberry plants or the imagoes inhabiting other than cranberry bogs. According to Scudder (8), "*epixanthe* occurs only in cranberry bogs where it flies near the ground and frequently rests on cranberry and sumac bushes." Cook and Watson (9) also describe the food plant as cranberry. Judging by the evidence presented above, it would appear very improbable that Boisduval received the specimens of *epixanthe* on which he founded the type from New Harmony. As to why such a possible error was made, there does not seem to be any satisfactory explanation. However, a note received from Mr. Wm. D. Field, of the United States National Museum, Washington, D. C., offers a plausible explanation. With Mr. Field's permission, I am publishing his note as follows:

The only entomologist known to have lived and collected at New Harmony, Indiana, prior to 1833, was Thomas Say. This gentleman was one of the original founders of the community in 1825. Prior to 1825, Say's home was in Philadelphia and he collected a great deal around this area as well as in New Jersey forming quite a large collection of insects. This collection he took with him to New Harmony. I suggest that it is quite possible that Boisduval received *epixanthe* from Say. This material was probably unlabeled and Boisduval assumed they were taken at New Harmony—the address of his correspondent at that time. I can find no evidence in Boisduval's or Say's writings that they did correspond or exchange or that Say sold or gave Boisduval any material. Say did write to numerous important entomologists of the period. Major John LeConte (Boisduval's American collaborator) may have been the person who received *epixanthe* from Say and the latter sent the specimens to Boisduval. If all this were true, then the real type locality would probably be somewhere in New Jersey or the environs of Philadelphia. It is recorded that Say collected in and around Great Egg Harbor, New Jersey (see pages 109–110 of "Thomas Say, Early American Naturalist," by Harry B. Weiss and Grace M. Ziegler, 1931).

Apparently no lectotype has been selected from the cotypes in the National Museum. Therefore, the female specimen labeled "*Chrysoph. hypoxanthe* Bdv. (*epixanthe*) Type," showing the least yellow on the under surface of the wings has been selected and labeled "lectotype." The other female specimen automati-

cally becomes a paratype. Furthermore, I have added to the United States National Museum collection, a small series of *Lycæna epixanthe*, comprising five ♂♂ and four ♀♀ as representing the eastern subspecies because they correspond with the Boisduval and LeConte type material. These specimens were all taken July 6, 1947 in a cranberry marsh near Lakehurst, New Jersey. As we are not sure of the actual type locality of Boisduval and LeConte's type, this small series will serve as a criterion or basis of comparison by representing the eastern subspecies. Each one has been labeled, "homotype."

A new subspecies of *Lycæna epixanthe* (Boisduval and Leconte) from Michigan and Wisconsin is described as follows:

***Lycaena epixanthe michiganensis*, new subspecies**

Holotype, Proud Lake, Oakland County, Michigan, July 1, 1945.

Collector: George W. Rawson.

Full expanse: 22.5 mm.

Description of upper surface:

Forewings: Similar to or identical with eastern *epixanthe* (as represented by Boisduval and LeConte's cotypical material in the United States National Museum, Washington, D. C.)

Hindwings: Similar to typical *epixanthe* except that the submarginal band or chain of orange-red lunules extends about two-thirds the length of the submarginal border. In the majority of specimens of the eastern subspecies the lunules extend along about one-half the length of the submarginal border.

Under surface:

Forewings: The ground color, greyish-yellow, is paler than in the eastern subspecies of *epixanthe*, the maculations standing out in bolder contrast against the lighter background. The black maculations running parallel with the outer border are narrowly margined with reddish-brown outwardly.

Hindwings: Ground color light grey, somewhat pearly or with a trace or suggestion of light blue when seen by reflected light. *This is the chief or distinctive feature of this subspecies.* The blackish maculations on the under surface of the secondaries are quite distinct and somewhat larger than in average specimens of the eastern subspecies. The band of orange-red lunules occurring on the lower surface is similar to that above although it does not extend quite as far towards the coastal margin. The lunules are also of somewhat brighter hue than in the eastern subspecies.

Allotype, Proud Lake, Oakland County, Michigan, July 5, 1944.

Collector: John H. Newman.

Full expanse: 25.5 mm.

Description of upper surface: Similar to the eastern subspecies on the upper surface of both the primaries and secondaries except the maculations are a trifle longer and broader. The band or chain of orange-red lunules extends about one-half the length of the submarginal border.

On the under surface, the orange-red lunules of the secondaries are about the same as on the upper surface and the ground color and the maculations are practically the same as described for the holotype. As in the case of the holotype, the pearly-grey ground color is the chief feature which distinguishes this new subspecies from the eastern race. Both the holotype and allotype have been deposited in the United States National Museum, Washington, D. C.

Paratypes:

Thirty-two specimens have been designated as paratypes and so labeled. Of these, eleven males and one female taken July 1-4, 1944-45, Oakland County, Michigan, are in the possession of Mr. John H. Newman, South Lyons, Michigan. A male specimen taken July 4, 1947 at the same place has also been added. Five males and one female taken in Washburn County, Wisconsin, July 20, 1946, and one female same locality, July 18, 1944 by Mr. Edward S. Thomas, Curator of Natural History, Ohio State Museum, Columbus, Ohio, are in the collection of the latter institution. Ten males and one female taken July 1-6, 1944-45 in Oakland County, Michigan are in my possession. Another female specimen (used for genitalic study) is in the collection of Mr. C. F. dos Passos, Mendham, New Jersey. Mr. Newman or I will make arrangements to have a few paratypes, or at least topotypical material deposited in the collections of the Museum of Zoology, University of Michigan, Ann Arbor, the American Museum of Natural History, New York City and in other institutions.

So far as the distribution of *Lycæna epixanthe michiganensis* is concerned, very little is yet known. We do know that this subspecies occurs in Washburn County, Wisconsin, and in Oakland County, Michigan, as well as in five other counties in Michigan according to Moore (10), namely, Alger, July 25, Chippewa, July, Dickinson, July 10-August 18, Keweenaw (Isle Royal) and Schoolcraft, August 21. Macy and Shepard's (11) reference to *epixanthe* as occurring in Minnesota and Kansas undoubtedly applies to the subspecies, *michiganensis*. Intensive search for the

species by Edward S. and John S. Thomas in the few cranberry bogs which remain in Ohio has so far proved unsuccessful.

It may be of interest to mention that so far as we have observed there appears to be no tendency towards noticeable variation in this new subspecies; in fact, it seems to be very stable and uniform. However, a comparatively small number of specimens have been collected and it is of course, possible that variants or aberrations may be found when a sufficient number of specimens have been obtained. Pale atypical or aberrant specimens of *epixanthe* are occasionally found in colonies associated with the typical eastern form. These closely resemble the new subspecies *michiganensis* in lacking the straw yellow-colored under surface of the wings. The principal difference is that the band of orange-red lunules on the under surface of the hind wings is not so extensive or so brightly colored as in *L. e. michiganensis*.

The total width or expansion of thirty paratypes are as follows:

	<i>Minimum</i>	<i>Maximum</i>	<i>Average</i>
27 males	23 mm.	26 mm.	24.0 mm.
3 females	25 "	26 "	25.6 "

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Note:

Slides of the male genitalia of *amicetus*, eastern *epixanthe* and the new subspecies *michiganensis* have been prepared by Mr. Cyril F. dos Passos with the following comments: "There appears to be no substantial differences between *amicetus* (Scudder) and

your subspecies, except that the former is somewhat smaller. However, both seem to differ from eastern *epixanthe* in that the latter appears to have larger labides, especially the distal section thereof. Further dissections should be made to ascertain if this is due to a distortion in my mount or whether the particular specimen dissected is somewhat aberrant."

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